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EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2624	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/629,993	TAI ET AL.	
	Examiner	**Art Unit**	
	James A Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 01 August 2000 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "18b" and "20b" which should be in figure 5. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "425" in figure 19. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because figure 9 shows a flow chart in which no steps are labeled. The steps of the method shown in the flow chart of figure 9 should be individually labeled and referred to in the specification.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because figure 24 shows a flow chart in which no steps are labeled. The steps of the method shown in the flow chart of figure 9 should be individually labeled and referred to in the specification.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Crean (US Patent 5,745,249). Claim 10 further limits the method of claim 1. Claim 16 further limits the system of claim 15. Since both claims contain essentially the same subject matter, said claims will be discussed together.

Regarding claim 1: Crean discloses an image processing method for generating a gray level rendered pixel value (column 4, lines 12-20 of Crean). Said method comprises the step of providing a digitized image that has a plurality of pixels (column 4, lines 30-34 of Crean) with each of the pixels being rendered into a halftoned microdot having a density (column 5, lines 9-12 of Crean), the microdot existing within

one of a plurality of halftoning planes (column 6, lines 9-21 of Crean), wherein the halftoning planes are indicative of an intensity value for the pixels (column 4, lines 12-20 of Crean).

Said method further comprises the step of forming a plurality of tiles from the microdots (figure 1 and column 4, lines 61-64 of Crean) in accordance with a screen angle (column 4, lines 62-64 of Crean) and a line ruling from a halftone screen (column 5, lines 16-22 of Crean) used to convert the pixels into the microdots (column 5, lines 23-27 of Crean), wherein each of the tiles comprises a repetitive sequence of microdots (column 6, lines 28-35 of Crean).

Said method further comprises the step of associating each of the microdots within the tiles by a coordinate position as well as the density value (column 5, lines 9-16 of Crean).

Said method further comprises the step of storing the tiles into a buffer having a length and a width (figure 11 and column 10, lines 5-12 of Crean). The address of the data in the buffer is based on both the row number and column number of each dot.

Said method further comprises the step of placing into the buffer an offset determined by the tile geometry, wherein the offset acts as a pointer to read data out offset by a predetermined amount in order to generate the repetitive sequence of microdots (column 6, lines 31-35 of Crean).

Said method further comprises the step of reading the buffer to retrieve stored image data comprising density value (column 7, lines 37-46 of Crean).

Regarding claim 2: Crean discloses that the density value for a pixel is a stored value that characterizes the value of the microdots in the halftone plane (column 7, lines 7-16 of Crean).

Regarding claim 3: Crean discloses using a brick based on the range of the continuous tone level in a region (column 5, lines 5-8 of Crean). This performs the same essential function as using an average density value for the tile since there is generally a wide range of pixel values in a real image. Using a range of tone levels or an average density value will both allow a determination whether or not to use a brick for a certain image or portion of an image.

Regarding claim 4: Crean discloses that the density value is a stored value within the buffer, the density value being an output from the halftone plane (column 7, lines 7-16 of Crean). The density value is an output from the halftone plane since it is based on the thresholding operations (column 7, lines 10-12). The density value is stored in the memory buffer (column 7, lines 11-16 of Crean).

Regarding claim 5: Crean discloses that the halftone plane is an input halftone plane that functions as an address to the buffer (column 7, lines 17-22 of Crean), the buffer data addressed being the density value that is an output halftone plane that is represented by a different number of bits than the input halftone plane (figure 10 and column 9, lines 1-22 of Crean). Crean teaches the option of performing image enhancement to eliminate stair-casing effects on the edges of characters and line art. Said enhancement requires an increase in the number of bits used.

Regarding claim 6: Crean discloses that the halftone plane is an input halftone plane that functions as an address to the buffer (column 7, lines 17-22 of Crean), the buffer data addressed being the density value that is an output halftone plane that is represented by the same number of bits as the input halftone plane (column 7, lines 44-48 of Crean). Image data is sent to the memory buffer and later output at the same rate by the output device. Resolution enhancement may be performed on the output data (column 9, lines 1-7 of Crean), but is not an essential operation and may be omitted if circumstances allow or require.

Regarding claim 7: Crean discloses that the buffer that stores halftone rendering values in accordance with a mixed dot growth pattern (column 4, lines 61-64 and column 5, lines 23-34 of Crean). The buffer is a form of memory that can be described as a lookup table since a lookup table requires simple memory addresses and corresponding values.

Regarding claim 8: Crean discloses that the buffer further comprises a second lookup table and in the lookup table there are stored halftone rendering values (column 5, lines 9-12 of Crean). Said halftone rendering values are in accordance with a partial dot growth pattern (column 5, lines 23-27 of Crean). The halftone rendering values are a separate set of memory than the dot growth patterns (figure 7 and column 7, lines 37-40 of Crean). Therefore said values can be considered a second lookup table since a lookup table requires memory addresses and corresponding values. The pixel values are used as a least significant bits of the overall addressing scheme of the sequencer

(column 7, lines 7-19 of Crean). Accessing these bits would give the device access to patterns based on a particular pixel value.

Regarding claim 9: Crean discloses forming tiles of halftone threshold values that are repeated throughout the image, offset at each column (figure 1 and column 4, lines 61-64 of Crean). A brick as defined by Crean is essentially a tile that contains a sequence of halftone threshold values for pixels (column 5, lines 1-8 of Crean). In order to determine the coordinate relative to the tile sequence in the X-direction (denoted by I), the image pixel address for both the row and the column (figure 1(20,L,P) and column 5, lines 9-12 of Crean), the overall width of the tile (figure 1(20,L) and column 4, line 62 of Crean), and the offset of the tile (figure 1(20,S) and column 4, lines 63-64 of Crean) must be considered. For a single tile at the origin, the pixel address relative to the overall image in the x-direction would be given by X. The output device scans in the X-direction, reaches the end, and returns to the beginning to resume scanning for each line (column 5, lines 12-19 of Crean). Therefore, for a tile that has a height in the Y-direction of 1, a width of Bw (L in Crean) and an offset of Bs (S in Crean) (column 5, lines 16-22 of Crean), the coordinate value I would inherently be determined according to a calculation wherein $I = (X+Y*Bs)\%Bw$, where % denotes the remainder of the division operation that is retained as the coordinate value.

Regarding claims 10 and 16: Crean discloses forming bricks of halftone threshold values that are repeated throughout the image, offset at each column (figure 1 and column 4, lines 61-64 of Crean). In order to determine the coordinate relative to the tile sequence in the X-direction (denoted by I), the image pixel address for both the row

and the column (figure 1(20,L,P) and column 5, lines 9-12 of Crean), the overall width of the brick (figure 1(20,L) and column 4, line 62 of Crean), and the offset of the brick (figure 1(20,S) and column 4, lines 63-64 of Crean) must be considered. For a single brick at the origin, which contains a block of a sequence of pixels (column 5, lines 1-8 of Crean), the pixel address relative to the overall image in the x-direction would be given by X. The output device scans in the X-direction, reaches the end, and returns to the beginning to resume scanning for each line (column 5, lines 12-19 of Crean). Therefore, for a brick that has a height in the Y-direction of 1, a width of Bw (L in Crean) and an offset of Bs (S in Crean) (column 5, lines 16-22 of Crean), the coordinate value I would inherently be determined according to a calculation wherein I = (X+Y*Bs)%Bw, where % denotes the remainder of the division operation that is retained as the coordinate value.

Regarding claim 11: Crean discloses forming bricks of halftone threshold values that are repeated throughout the image, offset at each column (figure 1 and column 4, lines 61-64 of Crean). In order to determine the coordinate relative to the tile sequence in the X-direction (denoted by I), the image pixel address for both the row and the column (figure 1(20,L,P) and column 5, lines 9-12 of Crean), the overall width of the brick (figure 1(20,L) and column 4, line 62 of Crean), and the offset of the brick (figure 1(20,S) and column 4, lines 63-64 of Crean) must be considered. For a single brick at the origin, which contains a block of a sequence of pixels (column 5, lines 1-8 of Crean), the pixel address relative to the overall image in the x-direction would be given by X. The output device scans in the X-direction, reaches the end, and returns to the

beginning to resume scanning for each line (column 5, lines 12-19 of Crean). Therefore, for a brick that has a height in the Y-direction of Bh (P in Crean), a width of Bw (L in Crean) and an offset of Bs (S in Crean) (column 5, lines 16-22 of Crean), the coordinate value I would inherently be determined according to a calculation wherein I = (X+(Y/Bh)*Bs)%Bw, where % denotes the remainder of the division operation that is retained as the coordinate value.

Regarding claim 12: Crean discloses a brick that has a height, which can be denoted by Bh (P in Crean) (figure 1 of Crean). For a plurality of bricks, the coordinate relative to the brick that is in the Y-direction, denoted by J, can be given based on the coordinate relative to the overall image that is in the Y-direction. Therefore, J would inherently be determined according to a calculation wherein J = Y%Bh, where % denotes the remainder of the division operation that is retained as the coordinate value.

Regarding claim 13: Crean discloses the step of blending rendered values from the halftoning process via at least one additional halftoning process (figure 10 and column 9, lines 42-55 of Crean). Image enhancement and visual smoothing can be performed for halftoning the data.

Regarding claim 14: Crean discloses the step of edge enhancement processing (column 9, lines 43-46 of Crean). Edges can be smoothed by means of resolution enhancement (column 9, lines 23-48 of Crean).

Regarding claim 15: Crean discloses an image processing system for generating gray level pixel values (figure 4; and column 5, lines 23-29 of Crean). Said system comprises a lookup table storing gray level pixel values (column 5, lines 38-41

of Crean) representing rendered values of a halftoning process into one of a plurality of halftoning planes (column 6, lines 9-21 of Crean).

Said system further comprises an input to the lookup table providing a coordinate value of a current pixel to be rendered and a gray level of the pixel to be rendered (column 5, lines 9-16 of Crean).

Regarding claim 17: Crean discloses that the lookup table stores gray level values (column 5, lines 38-41 of Crean) rendered from a digitized image that has a plurality of pixels (column 4, lines 30-34 of Crean) with each of the pixels being converted into a halftoned microdot that exists within one of the plurality of halftoning planes (column 5, lines 9-12 and column 6, lines 9-21 of Crean), wherein the microdots within the halftoning planes are indicative of the density value of the pixels rendered (column 4, lines 12-20 of Crean).

Regarding claim 18: Crean discloses that the lookup table stores a plurality of tiles from the microdots (figure 1 and column 4, lines 61-64 of Crean) in accordance with a screen angle (column 4, lines 62-64 of Crean) and a line ruling from a halftone screen (column 5, lines 16-22 of Crean) used to convert the pixels into the microdots (column 5, lines 23-27 of Crean), wherein each of the tiles comprises a repetitive sequence of microdots (column 6, lines 28-35 of Crean).

Regarding claim 19: Crean discloses that each of the microdots within the tiles is associated by a coordinate position, a density value as well as the plane value (column 5, lines 9-16 of Crean). Each microdot is organized within a pixel based on the density value of said pixel (column 5, lines 23-27 of Crean). Said pixel is organized in

the brick according to coordinate position (column 5, lines 9-11 of Crean). The density value essentially defines the plane value since each halftone threshold plane is used for comparison with an input density value (column 5, lines 23-27 of Crean).

Regarding claim 20: Crean discloses that the tiles stored within the lookup table buffer have a length and a width (figure 11 and column 10, lines 5-12 of Crean). The address of the data in the buffer is based on both the row number and column number of each dot.

Regarding claim 21: Crean discloses that the lookup table also stores an offset determined by the tile geometry stored therein, wherein the offset acts as a pointer to read data out offset by a predetermined amount in order to generate the repetitive sequence of microdots (column 6, lines 31-35 of Crean).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ludo Kerz, US Patent 5,581,372, December 3, 1996.

Thomas M. Holladay, US Patent 4,185,304, January 22, 1980.

Spaulding et al., US Patent 5,742,405, April 21, 1998.

Moro et al., US Patent 5,638,188, June 10, 1997.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-308-5397.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3500.

James A. Thompson
Examiner
Art Unit 2624

JAT
January 16, 2004

David K Moore

DAVID MOORE
SUPERVISORY PATENT EXAMINER
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